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The 'relative utility' approach for stimulating ICT acceptance: profiling the non-user

Business strategies and policies that were successful in increasing internet penetration in the early days may no longer be appropriate. This is most probably in countries where a majority of people is already connected to the internet. As more people are online, it becomes more likely that the remaining fraction of non-adopters is either hard to convince, under-skilled or simply lacking the financial resources to afford a connection.

In view of this problem, this paper proposes a policy approach to increase personal computer and internet acceptance in collaboration with the industry. The measures developed within this approach are based on strategies of segmentation and differentiation. This entails that product offerings are specifically targeted towards different socio-demographic groups in the population. In addition, our approach does not only concentrate on removing barriers, as most eInclusion policies do, but also at increasing the value of ICT for end-users.

This approach is based on a project that applied both qualitative and quantitative research methods to investigate the relation between the socio-demographic and socio-economic characteristics of non-users, and on the other hand, their profile in terms of access levels, ICT skills and attitudes towards ICT and their needs and expectations (if any) about ICT. In this paper we show, firstly, that members of homogeneous socio-demographic and socio-economic groups indeed share similar characteristics in terms of access, skills and attitudes and, secondly, that these groups can be effectively reached by policy makers and businesses with specific product offerings.

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> "ICT inequalities are not likely to diminish or disappear of their own accord. In societies that have already reached high levels of internet penetration, this may ask for specific measures that differ from those of the early days of the internet."

1 Introduction

eInclusion is one of the dimensions of overall inclusion and cohesion policies. In the meaning of the European Commission, eInclusion contains a twofold approach (eInclusion@EU, 2004: 3): Firstly, it focuses on preventing exclusion. This means that policies should prevent that disadvantaged people are left behind in the development of the information society. Secondly, eInclusion refers to exploiting new technological opportunities for a better inclusion of socially disadvantaged people or groups, or less favoured areas. In short, eInclusion refers to policies that enhance participation in society by means of ICT (Kaplan, 2005).

In view of the pervasiveness of ICT in society and our increasing dependence on ICT in everyday life, the capability to use ICT at home becomes a more important condition for social participation. The goal of any 'information society' policy should therefore be to achieve full internet access for all. This may require a continuous effort on behalf of policy makers. ICT inequalities are not likely to diminish or disappear of their own accord. In societies that have already reached high levels of internet penetration, this may ask for specific measures that differ from those of the early days of the internet. The fraction of remaining non-adopters may be structurally lacking financial resources to afford the internet, they may be poorly educated or under-skilled or they may be hard to convince to use the internet because they fear the technology or simply because they resent using it. In this paper we propose the findings of a research project that aimed at developing policy measures that are suitable for this context.

Our approach is characterized by two main features. First, unlike many eInclusion policies, our approach does not only aim at removing barriers but equally, or alternatively, at increasing the value of ICT for end-users. Second, the measures developed within this approach are specifically targeted towards different segments of the population, the assumption being that by focusing on specific groups (with low adoption rates) the proposed measures will be more effective and less expensive than generic policy measures.

The approach was born out of a confrontation of theory with political practice. This has affected the way in which we set up and conducted our research. In the first main section of this article we outline these practical considerations. In the second main section we describe our theoretical assumptions and their methodological elaboration. The third main section summarizes the main findings of our survey and evaluates their significance.

2 Field experience

The Federal Agency for Information and Communication Technology (Fedict) in Belgium is currently studying policy options based on our research. One of the possibilities being considered is the provision through commercial outlets of cheap customizable starter packages to people that are not yet connected to the internet at home. The offer would consist of a PC and internet connection, a free training session plus free access to a personalized information page. This campaign would need to be coordinated with telecommunications service providers, equipment manufacturers as well as professional and social organizations representative of certain categories of users.

The basic package would be offered to the general public through ordinary commercial outlets on a non-discriminatory basis. But most importantly, in addition, customized packages would be offered to specific user groups so as to accommodate the needs of specific segments of the population. The composition of these packages would be negotiated between the professional organizations, the industry and government. It is expected that the measures developed within our 'relative utility' approach will be more effective and relatively less expensive than the previous action on which it is partially inspired, the 'Internet for All' project of the Belgian government in 2006.

The 'Internet for All' campaign consisted of providing one affordable package deal to potential buyers, consisting of a PC, an internet connection plus a training session. The main 'political' difficulty was to

convince the industry (PC manufacturers, ISPs and retailers) to participate. Eventually, three consortia consisting of well-known PC manufacturers and ISPs offered a package. The main resistance was from the organization of small retailers, who feared the low profit margins would cause an unacceptable loss of income. After evaluation, the Internet for All project proved to be advantageous for the retailers as well as all other parties involved. It was calculated that the project contributed to 16% of the increase of new internet connections over a period of one year. The slipstream of the project was estimated to be 50%. The slipstream is buyers that were initially interested by the package but eventually opted for another (more expensive) commercial offering. Sum total is that the project contributed to almost a quarter of the increase of internet connections between March 2006 and March 2007.

A critical evaluation of the 'Internet for All' campaign revealed different elements, two of which inspired our research. The first was merely the confirmation of what could be expected. Not all of the groups in society were equally well served by the campaign. As noted in the previous paragraph, some preferred to buy a more performing and more expensive equipment, whilst for others the packages were too expensive, either because the up-front entry cost was too high, or because of the recurrent costs for an internet connection. The second source of inspiration was an incidental call of a representative of a professional organisation for physical therapists that proposed to target the campaign towards the members of his organisation. These two, apparently banal observations, triggered a reflection that inspired the new policy approach and adjoining research.

3 Research outline

3.1. Inequality in the information society

A variety of concepts exist that describe the nature of social divisions between people who are favourably placed in information resource distribution and others who are not (Vehovar et al, 2006: 280-281; Yu, 2006). The division is often defined as a gap between those who do and those who do not have access to computers and the internet (Van Dijk, 2005: 1). But such a dichotomous portrayal is scientifically not tenable. An increasing mass of research shows that conceptualizations of inequalities concerning ICT solely in terms of technologically 'rich' and 'poor' is too limited and rudimentary in analysis (Selwyn, 2004: 345; Van Dijk, 2006: 233). Income or socio-economic status remains the most important factor in explaining differences in ICT adoption and use. Lower levels of income are consistently shown to be associated with ICT inequalities (De Haan & Rijken, 2002; Lenhart & Horrigan, 2003), but there are several other inequalities running in parallel in industrialized economies:

- Gender differences (men having more access and using more ICT than women) are important in explaining inequality, even though recent research indicates declining gender differences in ICT access and basic levels of engagement (Compaine, 2001; Van Dijk & Hacker, 2003);

- Age is still one of the most important dimensions of ICT inequalities: increased age is associated with lower levels of access, limited modes of use and patterns of connecting. Age differences are especially pronounced in those individuals aged 60 and over (Van Kesteren & De Haan, 2000; Roe & Broos, 2005);

- Lower levels of education are shown to be associated with digital divides related to access and use of a range of ICT (Servon, 2002; Bonfadelli, 2003; Roe & Broos, 2005);

- Family structure or composition is related to more or less ICT access and use. The presence of school-age children tends to increase contacts with ICT (Van Rompaey, 2002);

- In addition to these variables there are others such as race, geography/rural-urban location, culture/social participation, etc. that determine access to and usage of ICT.

3.2. Relative utility theory

Our approach is articulated around the concept of 'relative utility', a sociological reinterpretation of the economic concept of 'marginal utility'. The notion of ‘cost’ is extended to any effort needed to appropriate a product, which is not only money but also, for example, the time required to acquire skills. Under ‘utility’, we understand all perceived benefits a user may obtain from using a product (Greene & Baron, 2001: 243). The relative utility of a product is the perceived increase of utility obtained by appropriating one more unit of that product in relation to the available resources. The term resources does not only refer to income, but to all socio-economic dispositions that influence the adoption and use of ICT.

It then becomes possible to determine a hypothetical 'turning point' for ICT adoption, namely the point at which the benefits will outweigh the costs of appropriating an ICT product for a certain category of users. This is based on the assumption that costs and benefits are similar for homogeneous socio-demographic and socio-economic groups. Homogeneity, in this context, means that people share the same characteristics in terms of the most important resources that determine the use of ICT: access, skills and attitudes (ASA). A specific combination of conditions in terms of access to ICT, skills to master the devices and attitudes towards the technology is then called an ‘ASA-profile’.

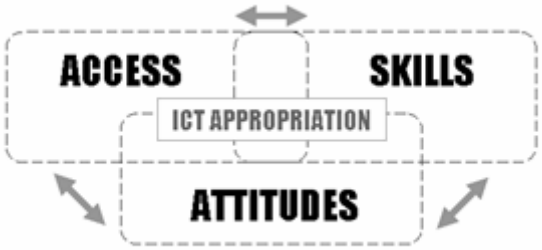

Figure 1. The ASA approach

On a practical level, in order to set up effective eInclusion measures, the advantage of this method is that groups of individuals with relatively homogeneous ASA-profiles can easily be identified and reached by policy makers. Very often they are represented by professional or social organizations that know how to reach them and are willing to collaborate with government. A specific offering can then be proposed to these groups, taking into account the specificities of their ASA-profile and socio-economic background.

For example, a high-income and low-skills group, say butchers, will be offered specific training, and attitudinal problems will be tackled taking into account their socio-economic background. A low-income and positive attitude group, say single mothers with children, may need less convincing but more help in terms of lowering barriers to entry. Moreover, it is also possible to increase the benefits of personal computer and internet usage, either by providing information about specific applications or by increasing the net added value of usage.

3.3. Our approach

The approach proposed is based on a research project comprising three consecutive research stages. Phase I aimed at refining the assumption that members of homogeneous socio-demographic and socio-economic groups share similar ASA-profiles. It consisted of a quantitative survey designed to gain insight into the perceptions of access, skills and attitudes by groups of individuals with shared socio-demographic and socio-economic characteristics. Phase II of the research consisted of qualitative in-depth and focus group interviews with respondents of each group. The main objective of this phase was to improve our understanding of why people do not use ICT at home and to examine possible leverages

to lift people over the turning point between non-usage and usage. Phase III intended the validation of the findings of the two previous phases.

In this paper we discuss the main results of Phase I, which consisted of a quantitative survey of non-adopters. We define them as people who do not use a personal computer and internet in a residential context. This means that they may use computer/internet at work or at other places, for instance in libraries or with friends or family. We wanted to test our assumption that individuals that belong to homogeneous groups with similar socio-demographic and socio-economic profiles will display a common ASA-profile (sharing the same characteristics in terms of resources that determine ICT acceptance). Furthermore, we also wanted ascertain that policy makers can effectively target and reach these people collectively, as a group. This compelled us to use a specific sampling method that took account of the affiliation of people with a representative professional or socio-economic organisation.

3.4. Sampling procedure

We recruited individuals as they are members of groups in society with a certain level of organization and that can be reached through a legitimate point of contact. These groups were sampled in a theoretical way, meaning that we selected individuals based on a limited number of characteristics, i.e. variables of which previous research has shown that they are of major importance for (non-)adoption of ICT. This resulted in certain prototypical profiles which are exemplary of the societal diversity without being representative for the overall population.

The following groups were selected:

1) Single mothers with children;

2) People who just started a basic computer and internet training;

3) People who manage a micro company (in our case butchers);

4) Liberal professions (in our case physical therapists);

5) Low educated people with a technical background (in our case labourers);

6) High skilled people with a technical education (in our case mostly with an engineering degree);

7) Unemployed people;

8) People who work in the social sector (in our case nurses);

9) Civil servants and

10) People who are aged 60 years and older.

A number of professional and social organizations helped us with the recruitment of the potential respondents. 200 individuals completed the questionnaire, of which 184 valid questionnaires were retained.

All users, except for group 2 and 6 are self-declared non-users. Nevertheless, approximately 80% of them indicate that they have access to a computer at home, and 66% have an internet connection at their disposal. These figures are quite high in comparison with the overall population: in 2007 is was estimated that in Flanders, where we recruited our respondents, 72% of the population owns at least one computer at home and 65% of the population has access to internet at home (FOD Economie, 2007). This bias can be explained by taking into account that, except for group 10, all respondents were recruited in the age group between 35 and 55.

In order to map their perceptions of computer and internet use at home, we presented the respondents with a list of statements. The statements were based on the adoption determinants of Rogers (2003: 222) and complemented with determinants developed by De Marez (2007: 365-424). A number of these statements aimed at obtaining information about the respondents' specific ASA-profile: (1) positive or negative attitudes towards computer and internet at home; (2) the presence or lack of skills and competences; and (3) the presence or absence of barriers to access ICT. Other statements served as measurement scales to gain insight in the influence of more generic factors such as, for example, the influence of social networks or marketing strategies of the ICT industry.

4 ASA-profiles

4.1 Main findings

Based on the mean scores of each statement (measured on a five-point scale varying from 'I do not agree at all' to 'I fully agree'), the perception of all users alike is that computers and internet are expensive. In addition, these respondents believe that ICT may be too expensive for a larger part of the population. The negative perception of the price factor only weakly relates to people's attitudes toward ICT. Indeed, even though respondents were selected as non-users (at home), we observed that a larger part of them have positive attitudes towards ICT. They think that using computers and internet at home will make life easier. Our respondents indicate that most of the members of their social network are enthusiastic about computer and internet at home. Social influence plays an important role but for most respondents negative perceptions of members of their social network will not restrain them to adopt computer and internet into the household.

Responses were much more divided on skills, measured via statements such as 'complexity' or 'self-efficacy'. Some report to be lacking the basic skills (which prevent them to start using a computer at home), whilst others can be considered as sufficiently ICT-competent, for example because they (have to) use the computer at work. In addition to the perceptions of the respondents towards complexity and usability of ICT, we also examined the actual ICT skills of our respondents. For this purpose they were shown a list of ICT related tasks, varying from very basic (for example, sending and receiving e-mail) to very complex (for example, installing a new version of Windows).

Respondents are most skilled in (basic) activities such as 'putting files into folders', 'word processing', 'e-mail', 'retrieving information via a search engine'. Many are familiar with tasks such as 'finding information via a search engine', 'sending and receiving e-mail', 'showing someone else what information you can find on the internet', 'moving a word to another place in a text' or 'adding a picture to a text'. For more complex activities such as 'keeping the computer up-to-date', 'repairing hardware troubles', or 'making a website' a growing part of the respondents filled in that they are not familiar with this and a smaller part of them indicates that they actually are capable to perform these tasks.

We asked people about their actual interest in computer and internet applications by asking them to rate different types of activities on a five-point scale varying from 'no interest at all' to 'very interested'. We applied a varimax factor analysis (SPSS) on the answers so as to reduce the list of 35 computer and internet applications to eight categories: 'information', 'news', 'pc-applications', 'eGovernment', 'learning & job', 'multimedia', 'bridging distances' and 'transactions'. Our respondents indicate that they are most interested in using ICT for information, news and basic computer applications. They have less interest in transactional services (with the exception of online banking, which people more see as a familiar 'informational service').

Another part of our survey examined the influence of the social network of the respondent on the use of personal computer and internet at home. We investigated the number of interactions with family, friends, acquaintances, colleagues and neighbours and, additionally, we mapped out the 'social resources' people have at their disposal within their social network, that is the social contacts that people can rely on to ask for advice when purchasing equipment or get assistance from in case of computer problems

(Van Dijk, 2005: 53). Other scholars studied the role of social resources in ICT acceptance and call these individuals 'warm experts' (Bakardjieva, 2005: 99) or 'local experts' (Stewart, 2007: 551). We also paid attention to the 'technological culture' of people's social network, which is the way people deal with technological artefacts and applications in their social relations and in the everyday culture of their households (Punie, 2000: 558). The results of this analysis show that family still is the most important determinant for the appropriation of computer and internet at home. People prefer getting help from family members for commercial advice and for troubleshooting as well as to learn new skills. The presence of these experts is not only important for the domestic use of computer and internet but also for taking full advantage of it, for example to help interpret and to make sense of the new information or services that become available (Wyatt et all, 2005: 211).

4.2 Further analysis

An important goal of the first research stage was to test the assumption that socio-demographically and socio-economically related respondents yield similar profiles in terms of access, skills and attitudes (ASA). We also wanted to know if it is possible to draw-up a consistent ASA-profile for people that are more loosely connected, that is through affiliation with a representative social organisation. We described this ASA-profile as the specific combination of conditions in terms of access to ICT, skills to master the devices and attitudes towards the technology.

To test this assumption we performed a cluster analysis (SPSS) based on the statements that we discussed in the previous section. The first step in the analysis consisted of reducing our five-point measurement scale to bipolar categories. We have interpreted the answers of the respondents on each statement in terms of their ASA characterization. For example, a person who fully agrees to the statement "Working at home with pc and internet is nice" gets an At+ score because we can confidently assume that this person has positive attitudes towards working with ICT. This way of working (for each of the 37 statements) allows us to distinguish the answers of the respondents in terms of bipolarities between Ac+, Ac-, S+, S-, At+ and At- and is necessary in order to compare the different cluster groups with each other.

Ac(cess)	+	people have no problem with access to computer and internet at home
Ac(cess)	-	people have problems with access to computer and internet at home
S(kills)	+	people are skilled sufficiently to master the devices
S(kills)	-	people lack skills to master the devices
At(titudes)	+	people have positive attitudes towards the technology
At(titudes)	-	people have negative attitudes towards the technology

Table 1. ASA bipolarity

The cluster analysis resulted in five distinctive groups with maximally internal homogeneity and external heterogeneity. We labelled each of these clusters:

LABEL	N
Incapable refusers	39
Self-conscious indifferents	34
The willing but incapable	13
Skilled ICT-lovers with limited access	30
Price sensitive positives	68

Table 2. ASA-profiles

Each of the groups has specifics characteristics in terms of ASA determinants:

- *Incapable refusers*: respondents of this group both lack the skills to master ICT and have rather negative attitudes towards ICT;
- *Self-conscious indifferents*: these are individuals who have negative attitudes towards the technology but for whom access and skills are not a problem;
- *The willing but incapable*: these respondents are motivated to use computer and internet at home, but lack the necessary skills and have difficulties accessing ICT;
- *Skilled ICT-lovers with limited access*: respondents of this cluster are ICT-literated and have positive attitudes, but access problems prevent them to use the computer and internet at home;
- *Price sensitive positives*: individuals of this last group have average ICT-skills, are moderately motivated and access to ICT is the main problem for them.

The clusters demonstrate the existence of different typologies in terms of ASA-profiles. These profiles indicate the motivation of people to use (or not) the computer and internet at home. Each profile represents a different combination of the factors investigated, in which each factor carries a different weight. Moreover, statistical testing is also conclusive about the relation between the ASA-profile and the group affiliation. The results of Chi-Square Test (Pearson Chi-Square) show a clear-cut relationship (statistical significance $p \leq 0{,}01$) between the membership of the groups (of the theoretical sampling) and the membership of the ASA-profiles.

The figure below gives an overview for which groups we could accept our hypothesis and indicates in which ASA-profile a majority of the members of the groups result in:

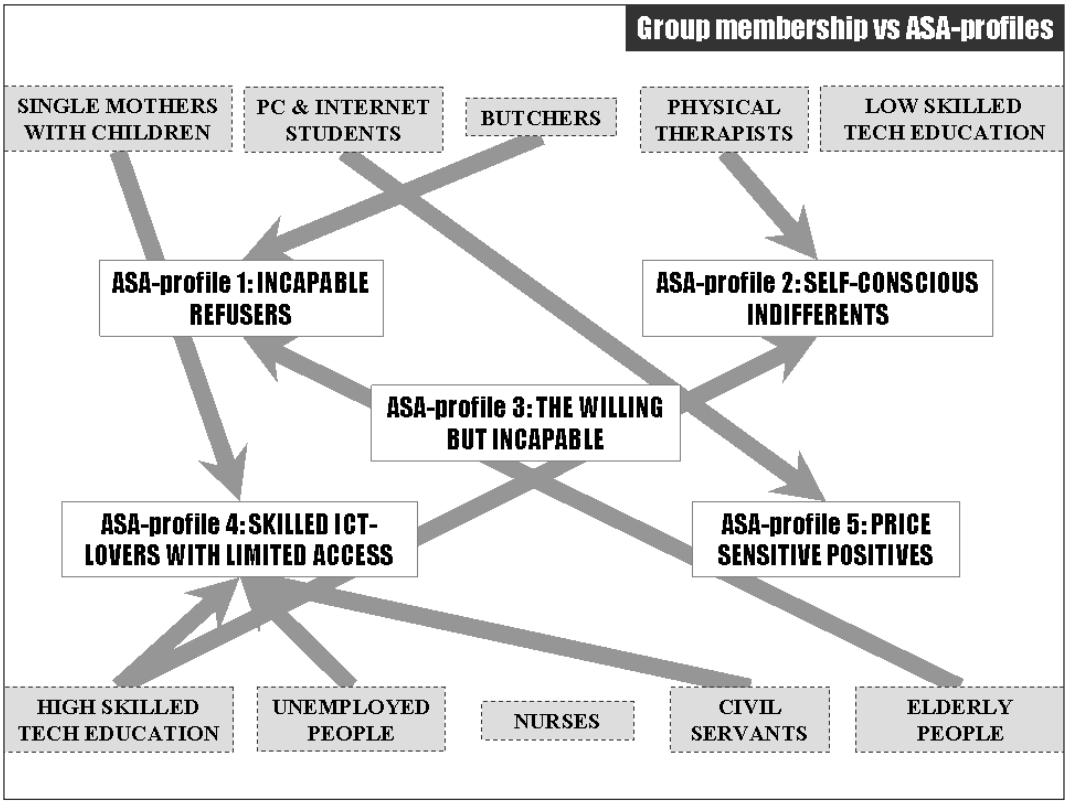

Figure 2. Membership of ASA-profiles

As shown in figure 2, there are two cases in which the socio-professional affiliation of people does not correspond with a specific ASA-profile: the nurses and the people with a lower technical education. Both groups are distributed across different clusters.

The nurses constitute what could be called a negative case (which may actually also be considered a confirmation of the validity of the approach). The nurses are represented in four of the five profiles, but under-represented in Profile 4, 'skilled ICT-lovers with limited access'. Our data indicate that this might be due to the fact that woman are generally more moderate in term of attitudes, the fact that the nurses in our sample were not able to familiarise themselves with ICT. The second exception is the lowly educated group with a technical background. This group is distributed across all profiles. The figures suggest that being male in combination with having a technical training, yields more positive attitudes than for the nurses. But this also causes them to be more dispersed across the different profiles. In this, they differ significantly from the higher educated with a technical diploma who have a clear-cut profile.

5 By means of conclusion

Our research provides an empirical foundation for a policy that aims at improving internet penetration by means of a segmentation and differentiation strategy. However, the research also cautions us for too hasty conclusions. Some of our findings have been counter-intuitive, in particular the observation that the group of nurses and the group of labourers did not generate or fall under any specific ASA-profile, even though they are homogeneous on the basis of critical factors such as education and income. The first, most evident conclusion would be that these groups are in fact heterogeneous in composition due to the influence of another factor. Our research is not conclusive in that respect. But even if it would, it leaves unanswered the question why other groups that were selected on the basis of education and income, such as the engineers and the physical therapists, do yield a specific ASA-profile.

Another possibility is that we actually may have traced evidence in support of our relative utility theory. This follows from the observation that the groups with higher education and income generate specific ASA-profiles, contrary to the groups with lower to moderate income and education. Relative utility means that the perceived 'cost' of ICT is related to the perceived 'utility'. If this is so, a relatively low perception of utility will have less negative effect on persons with a high income than on persons with a low income. The reason is that the cost of acquiring that utility represents a lower proportion of that persons' income and therefore takes a lower proportion out of the budget that could otherwise be spent on other utilities. Moreover, higher education generally contributes to a better and more positive perception of ICT-utility. Consequently, saying that high income and high education are decisive factors in fostering adoption is not the same as saying that a moderate or low income is decisive in motivating non-adoption.

The observation that attitudes towards ICT strongly differ in groups with lower incomes and lower education also suggests that adoption may also be stimulated by increasing the (perceived) utility of ICT for these people, as this will legitimate the expense for ICT. The next, qualitative, stage of our research will allow us to refine our insight on this matter. It will also help us to better understand the positive stimuli that might be decisive in generating ICT acceptance by specific groups.

Disclaimer

The points of view expressed in this paper are the sole responsibility of the authors. They do not by any means engage the Federal Agency for Information and Communication Technology, its political authorities or its partners.

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